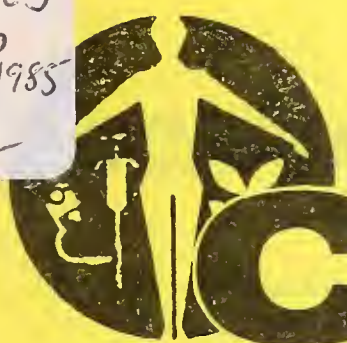


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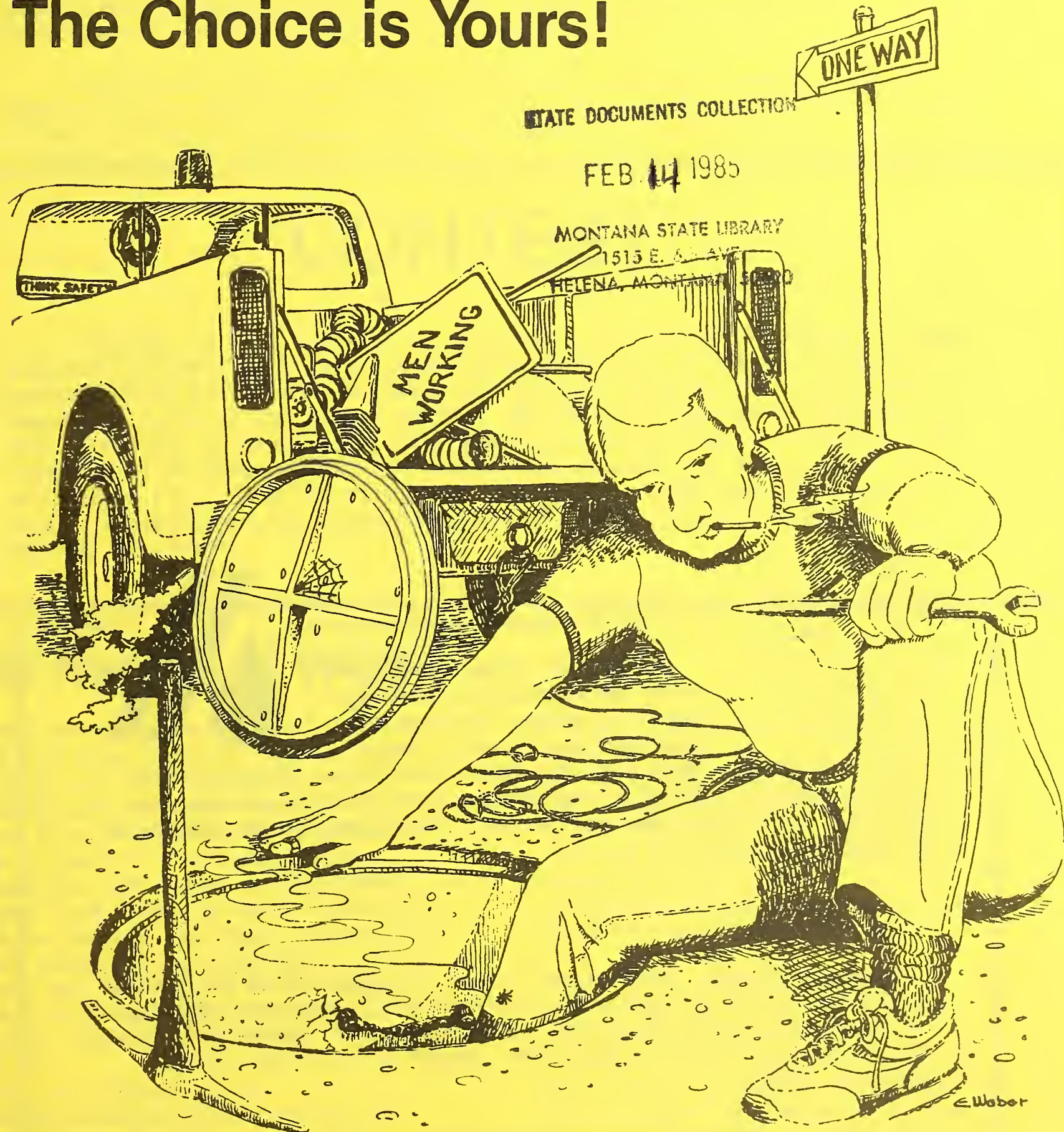


Big Sky PLEASE RETURN

Clearwater

Spring 1985

Death Trap, Injury or Safety
The Choice is Yours!



Annual Conference Issue



The Big Sky Clearwater--for
water and wastewater-treatment
operators across Montana--is
published two times a year by

the Water Quality Bureau of the State Department of Health and
Environmental Sciences in cooperation with the Montana Section
American Water Works Association and the Montana Water Pollution
Control Association.



Publication dates: March 1 and August 1. Last date to receive
contributions is 21 days before publication. Mail contributed
material to Water Quality Bureau, Department of Health and
Environmental Sciences, Room A206, Cogswell Building, Helena,
Montana 59620

Accidents Happen

Wastewater treatment and collection is one of the most hazardous fields of work. If you work in the wastewater field chances are one in ten that you will receive a disabling injury in the next year. Accidents do not just happen. Proper safety awareness and precautions can prevent almost any accident or injury.

Working in or around manholes results in the greatest incidence of injury and lost time in the wastewater industry. The cover picture depicts several safety hazards related to work in and around a manhole. Unfortunately this scene may be more common than not.

Manhole and collection system safety is a matter of common sense. Regular safety training and informal safety discussions at the job site can do much for safety awareness and the prevention of accidents.

CONTEST

Identify as many mistakes or hazards as you can in the cover drawing. Discuss the scene with co-workers and supervisors. The first person to submit a list of the most mistakes and hazards shown in the drawing will be awarded a prize at the annual Montana AWWA-WPCA conference in Missoula. The prize will be provided by Ken Johnston of Water Services Company. The winner will be announced at the conference, however you do not have to be present to win. Send your entry to: Jan Cranor, Water Quality Bureau, Dept. of Health and Environmental Sciences, A206, Cogswell Building, Helena, MT 59601.

New Names at WQB

Some new names and faces have come to the Water Quality Bureau (WQB) since our latest article. Tim Hunter and Mark Weston have left the Construction Grants program to go to work for municipalities, Hamilton and Helena respectively. They have recently been replaced by Diane Davison and Randy Nelson, who are environmental engineers. Mark Kerr has been added to the Water Quality Management staff doing water quality monitoring.

The new persons in the administrative staff are Edwina Wheat--permits, Linda Schofield--water quality management and Colleen Coats--Billings Branch

Office. Jan Gilman--Environmental Sciences Division (Don Willems) is periodically "loaned" to the WQB. She is the organizer and driving force behind the last two issues of the Big Sky Clearwater (she may continue with those responsibilities depending on her work load and sense of humor).

The WQB is responsible for enforcing the Water Quality and Safety Drinking water laws. However, a very important part of our work is technical assistance to the citizens of Montana. If you have any questions or need information, feel free to contact us 444-2406.

Trenching Safety - Who Cares?

BY: Scott Anderson
Water Quality Bureau

Frequently the factors opposing trenching safety in underground utilities construction predominate over the concerns and needs to maintain safe conditions during excavation. Minimizing pavement replacement by restricting trench width may prevail over maintaining adequate trench width to ensure slope stability. In bidded construction work, engineering firms will completely disassociate themselves from the matters of safety for fear of assuming legal liability if an accident occurs. Often, utility conflicts or nearby structures confine the working areas to the point of compromising safe working conditions. Familiarity with working in trenches and overcoming those initial fears of trench failure will lead to worker acceptance of a condition that may be unsafe.

Everyone involved in underground construction has the responsibility to maintain a safe working condition in the trench. Supervisors should be well aware of the physical conditions expected in the excavation area prior to sending their employees in. Resident engineering inspectors, while not dictating the means of achieving safety, have the moral responsibility to advise a contractor of the occurrence of an unsafe condition. If a life-threatening situation is observed, the resident inspector should consider shutting the project down regardless of what the project specifications say on limiting owner/engineer involvement in safety matters.

Workers and their supervisors should know what to expect prior to excavation and what must be done during excavation to safely meet their expectations. Consider the following before excavation:

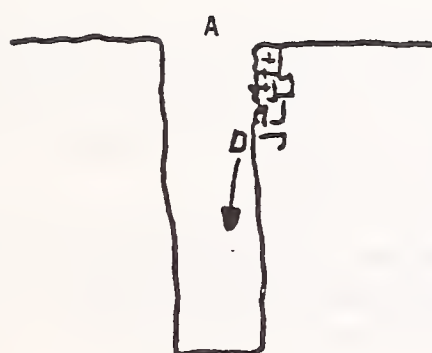
- Soils conditions (via soils reports, well logs, previous experience, etc.). Soil types, degree of compaction, and occurrence of man-placed fill versus native soils has a major effect on soil stability.
- Proximity to buildings, utilities, and sources of vibrations (i.e., traffic). Utility companies should be contacted and all lines marked. The effects of vibrations can be cumulative over time and are particularly dangerous to brittle soils such as clayey sand or composted gravel.
- Presence of groundwater. Groundwater can result in a stable soil in its dry state becoming unstable. Often trenches must be dewatered to facilitate pipe installation which will affect the natural condition of soil stability.
- Presence of surface waters. Drainage of surface waters into a trench and surrounding soils can result in increased loading in soils resulting in shear failures.
- Availability of necessary safety equipment. Shoring materials or steel boxes must be available when needed. Signs, barricades, ladders, and personal protection devices are essential to any trenching operation.

During trenching, the workers laying the pipe and equipment operators must be continually aware of the changing conditions around them. If trench boxes or shoring are not used, the walls of the trench must be sloped back with the degree of slope a function of soil type. OSHA standards dictate the percent slope for various soil conditions. The following conditions must be checked throughout the trenching process:

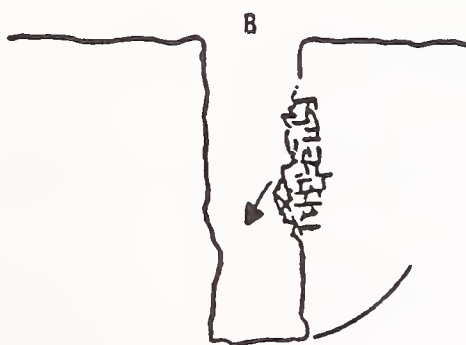
- Means of getting out of the trench. Climbing up a sloped trench wall during a cave-in is not usually possible. Ladders must be provided.
- Oxygen deficiencies may occur especially when working around live sewer or gas lines.
- Changing soil conditions. Soil types may change rapidly along the trench. Rainfall or groundwater will affect soil stability as well as water from leaking water mains.
- Location of waste materials. Soils must be placed at least 2 feet from the edge of excavation and more if trench walls are potentially subject to failure. The surcharge loading of the soils must be considered in any stability analysis.
- Adequacy of shoring materials. OSHA standards dictate the size and spacing of the components in the shoring system.
- Location of equipment and/or vehicles. As well as increasing the load on a potentially unstable trench wall, machinery can cause a failure as a result of vibration.

The following diagrams illustrate possible failure modes as a function of soil type that may occur in a trench.

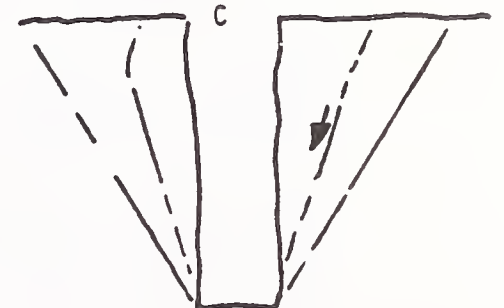
KINDS OF FAILURE OF GROUND



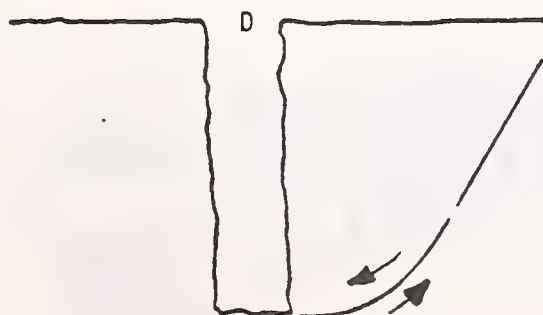
Raveling in
rock



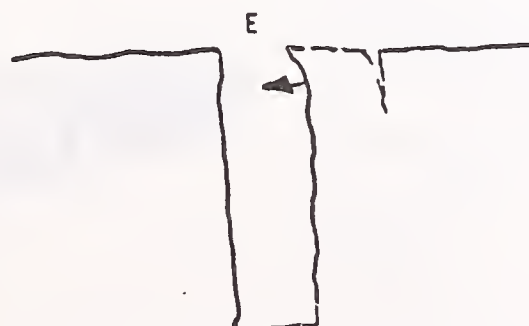
Block flow in
Rock



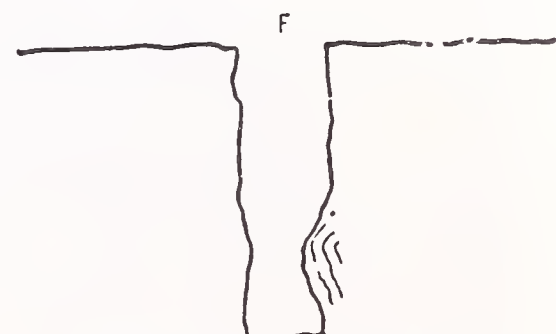
Shear failure in
predominately Sand-Gravels



Slip circle failure in
material predominately sand, silt,
clay mixed



Tension Crack in Clays



Bulging, swelling, slumping
in clays

In addition to protection of workers in and around the excavation, care should be taken to prevent accidents occurring with the general public. Most kids would like nothing better than to play in a large pile of dirt or slide into a trench. When work is not in progress, all construction areas should be adequately barricaded or surrounded with snow fencing. Hazard signs and warning lighting should be used to prevent traffic mishaps. Prior to initiation of a large project, the responsible public works official should notify (in writing) all residents within the vicinity of the project of the potential hazards and inconveniences they may face with the upcoming project.

Trenching Accident Kills Man

Albert Snodgrass was killed October 4, 1984 in Ashland in a sewer line trench cave-in while voluntarily helping install the line.

Snodgrass and a person operating a backhoe were installing the sewer line for the Ashland Water and Sewer District when the accident occurred.

The victim was pulled from the seven to eight foot trench and flown by helicopter to St. Vincent's Hospital in Billings.

Snodgrass was one of the key persons involved in establishing the Ashland Water and Sewer District.

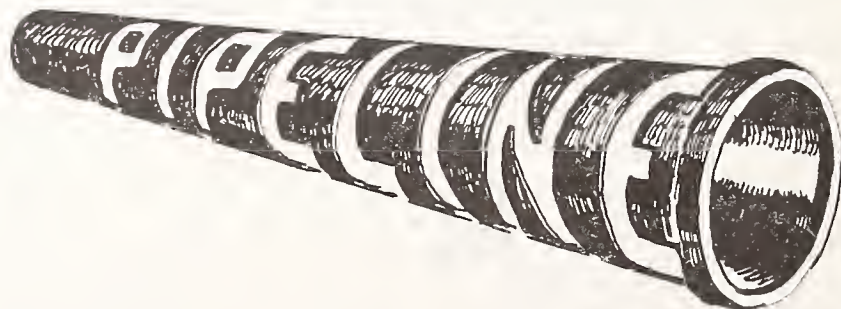
Sewer Gas Blamed in Building Blaze

The fire that destroyed the McKay and Carmichael Building in downtown Whitehall in October was blamed on sewer gas. Investigators found an old sewer line under the building that had been plugged ruptured. A large exhaust fan that was being used to control humidity apparently sucked the methane from the sewer line into the building. There was no explosion so the cause of the blaze remains unknown.

A fire in the same building six weeks earlier may have been caused by a chemical reaction between methane from the old sewer line and chemicals in the beauty shop.

At the request of concerned property owners, Bill Hooper of the Occupational Health Bureau, Department of Health and Environmental Sciences, checked the basements of neighboring businesses and found no indication of explosive gas.

People who own old buildings should check old sewer lines.



AWWA Helps Pave Way to Success

AWWA was formed 100 years ago by a handful of water supply people with an idea. In the past century, that idea has blossomed into the largest international scientific and educational society dedicated to improving drinking water. AWWA's widely acclaimed education, research, technical and publications operations are supported by a network of more than 35,000 representatives. This network continually expands to encompass most of the globe.

Membership in AWWA is extremely rewarding for any individual, firm, organization or agency interested in the improvement of drinking water for people everywhere. There are endless opportunities to share information and opinions on technology, research, government affairs and other developments in the water supply field.

Operators! You can join AWWA as an affiliate member for only \$19.00 per year.

Affiliate membership is exclusively for personnel of water utilities with fewer than 1000 services or for employees in a non-supervisory position in any utility.

*Affiliates do not receive the AWWA Journal.

Active membership is for water utility personnel, municipal officials, consultants, educators, etc. Annual dues are \$48.00.

Student membership is for enrolled college students. Annual dues are \$15.00.

Success can be yours when you are an AWWA member. For more information, contact one of the local membership chairpersons:

Charolotte Jones
Public Works Department
P.O. Box 5021
Great Falls, MT 59403
727-5881 (ext. 413)

Denise Ingman

A-206, Cogswell Building
Helena, MT 59620
444-2406

The following are some of the services and benefits membership in AWWA brings you:

JOURNAL AWWA, the world's most valuable source of technical and management water supply data.*

MAINSTREAM, a monthly news publication packed with important features and news stories about activities and achievements of Association members throughout the world.

OPFLOW, the widely acclaimed and highly readable monthly publication that provides operators with ideas, services and useful how-to information.

TECHNICAL LIBRARY, a computerized data center that provides immediate access to worldwide sources of information on the water supply industry.

Education opportunities, including regularly scheduled seminars and workshops, education services and specially packaged education programs.

Group Insurance eligibility.

Low member rates on all AWWA standards, manuals, handbooks and other fine publications.

Free employment listings in Mainstream.

Free Membership in the AWWA section where you live or work, with opportunities to participate in all section activities.

10-35% Avis car rental discount.

Access to WATERNET, AWWA's data base of information about water supply and water treatment technology.

*Not to affiliate members.

Join AWWA Today.

Do yourself and your career a favor by joining the American Water Works Association. Membership in AWWA provides you with a wealth of knowledge on the most up-to-date information in the water supply industry. AWWA addresses current and relevant problems and practicalities of the water supply field. You can be informed and in-the-know when you join the team of professionals who belong to AWWA.

Become a member of AWWA. Just fill out the application and mail it to AWWA, c/o Denise Ingman, Water Quality Bureau, Department of Health and Environmental Sciences, Cogswell Building, Helena, Montana 59620



AWWA INDIVIDUAL MEMBERSHIP APPLICATION

AWWA USE ONLY

CHECK TYPE OF MEMBERSHIP

- | | Grade Code | Annual Dues |
|---------------------------------------------------------------------------------------------------------------|------------|-------------|
| <input type="checkbox"/> Active | 02 | \$48.00 |
| <input type="checkbox"/> Affiliate
(Strictly for operator-level personnel or employees of small utilities) | 06 | \$19.00 |
| <input type="checkbox"/> Student
(Must be enrolled and carrying at least 10 credit hours) | 14 | \$15.00 |

IMPORTANT

Affiliate applicants give number of customers your utility serves _____

LAST NAME Please print

FIRST NAME (and middle initial)

MAILING ADDRESS

CITY

STATE OR PROVINCE

ZIP

AREA CODE

TELEPHONE

TITLE

EMPLOYER'S NAME (IF NOT ALREADY IN MAILING ADDRESS)

APPLICANT'S SIGNATURE

DATE

SIGNATURE OF AWWA MEMBER ENDORSING APPLICATION

ENDORSER MEMBER NUMBER

PRINT LAST NAME OF ENDORSING MEMBER

ALL APPLICANTS COMPLETE THIS SECTION:

Circle the descriptions below that best describe YOU. The information is used in surveys of AWWA readership. Circle ONLY one in each group.

1. BUSINESS AND INDUSTRY

- A Public Water Supply Utility—Municipally Owned
- B Public Water Supply Utility—Investor Owned
- C Governmental—Federal State Local
- D Consultant
- E Contractor
- F Private Industrial Systems or Water Wholesaler
- G Manufacturer of Equipment & Supplies including Representatives
- H Distributors of Equipment & Supplies including Representatives
- I Educational Institutions Faculty and Students Libraries and Other Related Organizations
- J Fully Retired
- K Research Labs

2. JOB TITLE

- A Executive—Gen'l Mgr. Commissioner, Board Member, City Mgr., Mayor, President, Vice President, Owner, Partner, Director, etc.
- B Management—Division Head, Section Head, Dept. Head, Mgr., Chief Engineer, Comptroller, etc.
- C Engineering non-managerial—Civil Engr., Mech. Engr., Envir. Engr., Planning Mgr., Field Engr., Systems Designer, etc.
- D Scientific non-managerial—Chemist, Biologist, Biophysicist, Researcher, Analyst, etc.
- E Purchasing—Purchasing Agent, Procurement Specialist, Buyer, etc.
- F Operations—Foreman, Operator, Maintenance, Crewman, Service Rep., etc.
- G Marketing & Sales non-managerial—Mkt. Analyst, Mkt. Rep., Salesman, Sales Rep., etc.
- H Other describe _____

3. CHECK FIELD(S) SERVED

- 5 ☐ Water Supply Only
- 7 ☐ Wastewater Only
- 9 ☐ Both
- 3 ☐ Other

PREPAYMENT OF ONE YEAR'S DUES REQUIRED:

- 1. If you ask to be billed, you will be billed. No other action on your application can be taken until payment is received.
- 2. An acknowledgment will be mailed to you. If you haven't heard from AWWA in one month:
 - a. contact your section's Secretary or Membership Committee Chairman. The application may have been held up there inadvertently.
 - b. contact AWWA in Denver with an inquiry.

- ☐ Check Enclosed
- ☐ Please send bill to

- Charge to my
- ☐ MasterCard
- ☐ Visa
- Card No. _____

Dues allocated for each publication members receive: Journal \$20 • Mainstream \$6 • Opflow \$5 • Research Foundation \$3 •

In some AWWA sections, a portion of the section allotment equal to 50 percent or more of the domestic subscription rate charged for the section periodical will be allocated toward a subscription to that periodical.

Dedication Places Kleman at Top

Operator Profile

Dedicated workers are hard to find these days and Emil Kleman is one of a vanishing breed.

Kleman retired December 31, 1984 after being the superintendent of the Hamilton sewage treatment facility since 1955. The new treatment facility was dedicated to him--much to his surprise--with a large plaque hanging outside the control building of the new facility.

"I knew my name was going to be there, but I thought it was going to be on the bottom," Kleman said. "I was surprised to be the first name up there. It's still kind of hard to believe."

Kleman was born August 14, 1917 in Lemon, South Dakota, and spent most of his younger years in Hedding, North Dakota. Never any stranger to work, he began helping his father haul coal when he was 10 years old and worked on ranches and farms. Kleman's family moved to Hamilton in the early 1930's and he followed in 1935. Unlike his family, Kleman and a couple of buddies arrived in a freight train boxcar with only a few pennies in their pockets.

One of his first jobs in Montana was working as a laborer on the construction of Fort Peck Dam. After settling in Hamilton he worked as a laborer at the Bitterroot Stock Farm, Taber Sawmill and for the Associated Seed Company. He soon met and married his wife.

He began working for the City in 1954 and was assigned a pickup truck, but was expected to provide his own tools. Kleman continued to buy and replace the tools he used in his job until a few years ago.

For the past 30 years, he has been on call 24 hours a day, almost every day of the year. He worked all holidays and weekends alone, and took few vacations. In fact, Kleman felt being called away from Thanksgiving dinner was just part of the job.

Although he knew little about sewage treatment when he started, he attended numerous classes and conferences and learned as he went along. When Kleman started, treatment facilities only settled out the sewage, now the end result is water almost clean enough to drink he said.

His favorite hobby is attending auction sales, where he continues to purchase tools and other odds and ends. He has become so well known at one local auction barn that he has his own chair reserved at all times.

Kleman's other hobby is his ranch. He owns a small ranch west of Hamilton where he raises a few cattle and cuts his own hay. He uses two old John Deere tractors (which he bought at an auction, no doubt). The tractors are almost antiques, but they get the job done.

Kleman has been was an outstanding employee for 30 years, and the WQB joins his friends and fellow workers in wishing him a happy retirement.



WPCF Advances Water Pollution Control

The Montana Water Pollution Control Association (MWPCA) is one of 65 associations which comprise the Water Pollution Control Federation (WPCF). It is dedicated to advancing the interests of water pollution control in Montana.

There are essentially five categories of membership in the WPCF/MWPCA:

1. Active/General Members: This group makes up the largest category. It includes people in all different aspects of pollution control, such as municipal officials, superintendents and operators of pollution control facilities, professional engineers, chemists, biologists, bacteriologists, researchers, teachers and state and federal pollution control officials. Active members receive all the benefits of national federation and state association membership (including the WPCF Journal and the newsletter Highlights) with the exception that they do not receive the publication Operations Forum.

2. Operations Division Members: This membership is restricted to those actively employed by the responsible operating entity, which includes operation and maintenance of wastewater collection facilities, wastewater treatment facilities and laboratories. Operations members receive the monthly publication Operations Forum, dedicated exclusively to needs of operations and maintenance personnel. They also receive all other benefits of national federation and state association membership, with the exception that Operations Division members do not receive the WPCF Journal or the Highlights newsletter.

3. Corporate Members: These persons include those employed with public or private corporations (in part or in whole), governmental boards, districts or commissions, or other corporate bodies and organizations. Corporate members receive all of the benefits of national federation and state association membership, with the exception that they do not receive the Operations Forum.

4. Student Members: Students who are currently enrolled in a college or university and who spend at least one-half of their time on academic course work, or its equivalent, may become student members of the WPCF/MWPCA. Student members receive all benefits of federation and association membership, with the exception that they do not receive the Operations Forum.

5. Dual: This membership category allows members of other WPCF Associations, who do business with or are involved with the Montana water pollution control industry, to join the MWPCA. This allows out-of-state water pollution control professionals to further their contacts with the Montana water pollution control community. Dual members also receive the MWPCA newsletter Big Sky Clearwater.

For over 56 years the WPCF has been in the business of developing and disseminating information concerning the nature, collection and treatment of domestic and industrial wastewater. For the last 50 years this non-profit organization has been the driving force behind the nation's clean water program. WPCF urges eligible persons to consider joining its 30,000 members.

The advantages of belonging to the WPCF include:

Journal Water Pollution Control Federation -- the journal is considered one of the most authoritative publications in the field of wastewater treatment, analysis and disposal.

Highlights -- this monthly newsletter keeps you up-to-date on WPCF activities, news of interest and current events in the field.

Operations Forum -- the forum is the first monthly publication dedicated exclusively to the needs of operations and maintenance personnel.

Literature Review and Yearbook -- each year the entire June issue of the Journal is devoted to reviewing resource materials available in the water pollution control field. The 350-page literature review is invaluable to persons trying to keep abreast of new resource and reference information.

Technical Publications -- the Federation publishes more than 50 books and audio-visual courses dealing with wastewater treatment.

Awards -- the WPCF has an annual awards program to recognize outstanding contributions by its members and others to the organization and to the pollution control fields.

Public Education -- greater public awareness of the role, function and necessity of wastewater treatment is a primary mission for WPCF. Special publications and programs on water quality are designed to keep the public informed.

Technical Assistance -- the Technical Services Department handles hundreds of written requests and telephone calls per year for information.

Government Affairs -- as recognized authorities in the fields of wastewater treatment, WPCF members are often asked to testify before Congress. Each year the Federation hosts the day-long Government Affairs Seminar in Washington.

Annual Conference and Exposition -- WPCF's Annual Conference and Exposition is the largest devoted solely to wastewater treatment in the U.S. This week-long event attracts up to 10,000 participants, who come to attend over 50 technical sessions, and review as many as 300 manufacturers and firms exhibiting their equipment and processes at the Exposition.

For more information contact:

Steve Potts
Environmental Protection Agency
Federal Building; Drawer 10096
301 S. Park
Helena, MT 59626

Send applications to:

Joe Steiner
Water Quality Bureau
Dept. of Health and
Environmental Sciences
Cogswell Building
Helena, MT 59620

JOB OPENING

The Kalispell Wastewater Treatment Plant has an immediate opening for an experience Lab Tech/Operator. Salary \$8.30/hour starting, \$9.22/hour after 6 months.

Contact Kalispell Job Service.

Application for Membership All Categories

Instructions for Completing this Application

1. Please fill in your name and address.
2. Check the appropriate boxes in the MEMBERSHIP/ADD-ON BENEFITS CHART below.
3. Fill in the Employer/Work and Education codes in the spaces below. (Select codes from the list at the bottom)
4. Include your payment. Please make checks payable to the *Water Pollution Control Federation*.
5. Send your completed application to:
WPCF, Data Management • 2626 Pennsylvania Ave., N.W. • Washington, D.C. 20037

1. Name _____
 Employer _____
 Address _____
 City/State/Zip _____
 Telephone _____

2. MONTANA WATER POLLUTION CONTROL ASSOCIATION/WPCF MEMBERSHIP/ADD-ON BENEFITS CHART

MEMBER CATEGORIES:	Active/General	*Professional Operations (PWOD)	Student	Corporate
Check One	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DUES:				
Member Assoc.	\$5.00	\$5.00	\$2.00	\$5.00
WPCF	\$45.00	\$15.00	\$15.00	\$160.00
SUB-TOTAL	\$50.00	\$20.00	\$17.00	\$165.00
CHECK ADD-ON BENEFITS:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Journal	Included	\$40.00*	Included	Included
Forum	\$10.00	Included	\$10.00	\$10.00
Highlights	Included	*\$40.00 payment includes Highlights	Included	Included
Total	\$_____	\$_____	\$_____	\$_____

3. Employer/Work ☐☐☐☐ Education ☐
4. Bill me ☐ Amount Enclosed \$_____

EMPLOYER/WORK

Local/Regional Government or Agency (including Utility District)

11PA—Public Official (i.e., City Mgr., City Engr., Dir. Pub. Works)
 11WQ—Water Quality Planning
 11DS—Design/Specifications
 11TP—Treatment Plant O/M
 11CS—Collection Systems O/M
 11LY—Library

State/Interstate Government or Agency

13WQ—Water Quality Planning
 13WW—Water/Wastewater Analysis/Monitoring
 13EI—Enforcement, Inspection, Plans Review
 13LY—Library

Federal Government or Agency

16WQ—Water Quality Planning
 16WW—Water/Wastewater Analysis/Monitoring
 16EI—Enforcement, Inspection, Plans Review
 16RE—Research

16LY—Library

Consulting Firm (Engineering/Other)

21WQ—Water Quality Planning
 21DS—Design/Specifications
 21WW—Water/Wastewater Analysis/Monitoring
 21TP—Treatment Plant O/M
 21CS—Collection Systems O/M
 21CN—Construction
 21RE—Research
 21LY—Library

Wastewater Equipment/Material Manufacturer/Supplier

25SA—Sales
 25CN—Construction

Industry

27WQ—Water Quality Planning
 27DS—Design/Specifications
 27WW—Water/Wastewater Analysis/Monitoring
 27TP—Treatment Plant O/M
 27RE—Research

27LY—Library

Construction Contractor

28CN

Educational Institution

31RE—Research
 31TE—Teaching
 31ST—Student
 31LY—Library

Other

61 (Specify) _____

EDUCATION

- (1) Less than High School
- (2) Training Courses, Short School
- (3) High School
- (4) Attended College
- (5) Completed Junior College
- (6) Bachelor's Degree
- (7) Advanced Degree

51 Operators Pass Test

Fifty-one persons passed their examinations for full and operator-in-training certification at tests given last September.

To be fully certified as a plant operator, an applicant must pass examinations indicating proficiency in certain aspects of chemistry, bacteriology and hydraulics. In addition, certain experience requirements are specified for each level of classification, ranging from six months' experience for Class 4 operators to two years for Class 1 operators.

The type of exam passed is described by a number, a letter and perhaps an OT. The number describes the class of the operators and is based on the complexity of the facility or the population serviced, with first class designating the most complex system or the highest population serviced. The letter describes the type of operator; A--water distribution; B--water plant; C--wastewater plant and D--industrial wastewater operators. Those who have passed the examinations but have not completed the experience requirements are certified as operators-in-training (OT).

Those receiving full certification or operator-in-training certification were:

Class 1:

Vernon Carlson, Missoula, 1C--OT
Richard Cottingham, Helena, 1A and 1B
Douglas Jessen, Wolf Point, 1B--OT and 1C-OT
Jack Kobasziar, Great Falls, 1C--OT
Kurt Kramer, Hardin, 1B and 1C
Kevin Kundert, Helena, 1A--OT and 1B--OT
Curt McCamish, Ekalaka, 1C--OT
John McCracken, Colstrip, 1A--OT and 1B--OT
Randy Pearson, Havre, 1B--OT
Scott Summers, Bozeman, 1C
Sean Thurston, Bozeman, 1C--OT

Class 2:

Leon Anderson, Seeley Lake, 2B
Steven Damon, Columbia Falls, 2B--OT
Dan Erickson, Conrad, 2B
Jeffrey P. Harker, Columbia Falls,
2A--OT and 2B--OT
Michael Jacobson, Livingston, 2C--OT
Richard Kittel, Hamilton, 2A--OT
Gerald Lawver, Laurel, 2C--OT
Rick Millard, Wolf Point, 2A
James O. Phillips, Willow Creek, 2C
Paul Torok, Fort Benton, 2A

Class 3:

Cordi Bechler, Bozeman, 3C
John Demarais, Malta, 3A--OT and 3C--OT
Dan Erickson, Conrad, 3A
Jeffrey Harker, Columbia Falls, 3C
Michael Jacobson, Livingston, 3B--OT
Robert Jones, Three Forks, 3A--OT
Richard Kittel, Hamilton, 3B

Class 3 Continued:

Curt McCamish, Ekalaka, 3A--OT
Jay McEvers, Bozeman, 3C
Elmer Peterson, Anaconda, 3C--OT
Thomas Phippen, Ennis, 3A
Hugh Robertson Jr., Helena, 3C
Allen Sloan, Pablo, 3A and 3B

Class 4:

Leon Anderson, Seeley Lake, 4A
Cordi Bechler, Bozeman, 4AB
Dennis Carlson, Billings, 4AB
Sidney Durham, Winnett, 4AB
Everett Egbert, Belgrade, 4AB
Joseph Eva, Three Forks, 4B
Timothy Farwick, Fort Benton, 4C
Robert E. Jones, Three Forks, 4B and 4C
Curt McCamish, Ekalaka, 4B--OT
Jay McEvers, Bozeman, 4AB
Donald Periman, Great Falls, 4AB
Thomas Phippen, Ennis, 4B--OT and 4C--OT
David Rexhausen, Nashua, 4B
David Taylor, Westby, 4AB
Leo Zahn, Billings, 4AB

Class 5:

Donald F. Bastian, Manhattan, 5AB
William Ludwick, Polson, 5AB

Calendar of Training Events

<u>Date</u>	<u>Topic</u>	<u>Location</u>	<u>Sponsor</u>	<u>Registration Fee</u>
Feb. 5	Electrical Controls	Great Falls Fire Training Center 1900 9th St. S. 8:30 a.m.-4:00 p.m.	Joint Education Committee AWWA/WPCA	10.00 members 15.00 nonmembers
Feb. 6	Electrical Controls	Billings City Wastewater Treatment Plant Administration Building Conference Room 8:30 a.m. - 4:00 p.m.	Joint Education Committee AWWA/WPCF	10.00 members 15.00 nonmembers
Feb. 7	Electrical Controls	Missoula County Sanitarians Conference Room 2nd Floor 301 W. Alder 8:30 a.m. - 4:00 p.m.	Joint Education Committee AWWA/MPCF	10.00 members 15.00 nonmembers
Feb. 19	Repair of Chlorination Equipment and Safety	Fort Benton	Montana Rural Water Systems, Inc. (MRWS)	none
Feb. 21	Repair of Chlorination Equipment and Safety	Shelby	MRWS	none
May 7	Tapping Water Lines	Missoula	MRWS	none
March 14	Electrical Circuits and Electronics	Havre	MRWS	none
March 22 ^t	Using Computers in Your Water/Wastewater System	Havre	Joint Education Committee AWWA/WPCA	10.00 members 15.00 nonmembers
April 9	Repair of Chlorination Equipment and Chlorine Safety	Miles City	MRWS	none

<u>Date</u>	<u>Topic</u>	<u>Location</u>	<u>Sponsor</u>	<u>Registration Fee</u>
April 11	Repair of Chlorination Equipment and Chlorine Safety	Billings	MRWS	none
April 11	Water Distribution (tapping, pipe specifications, hydrants and valves, meters)	Great Falls City Shop Building	Joint Education Committee AWWA/WPCA	10.00 members 15.00 nonmembers
May 22	Well Maintenance and Leak Detection	Twin Bridges	MRWS	none
June 19	Pump Packing and Seals	Sidney	MRWS	none
June	A Wastewater Laboratory Workshop is tentatively set for the 1st or 2nd week of June to be in 2-3 locations for three days; class size will be limited, cost will be approximately \$50.00 - sponsored by Northern Montana College and the Water Quality Bureau.			

Seminar notices, including all pertinent information, will be mailed separately approximately one month prior to the AWWA/WPCA seminars and about two weeks prior to the MRWS seminars.

More information can be obtained by contacting the following persons:

MRWS Seminars	JEC - AWWA/WPCF
Ray Wadsworth	Kristi Kline
1824 10th Ave. S. Suite 4B	Box 231
Great Falls, MT 59405	Havre, MT 59501
454-1151	265-9031

t tentative date

Examination Notice

ON SATURDAY-----MARCH 16, 1985-----9:30 A.M.

examinations for certification as a Water Distribution System Operator, Water Treatment Plant Operator, and Wastewater Plant Operator will be given at these eight locations:

BILLINGS-----in the Copper Room of the Student Union Building at Eastern Montana College

BUTTE-----in Room 108 of the Mining and Geology Building at Montana Tech

GREAT FALLS----in Room S119 of the Science Amphitheater, College of Great Falls

HAVRE-----in Room 103-4 of the Math/Science Building at Northern Montana College

HELENA-----in Conference Room D (same as C209), Cogswell Building (Broadway entrance)

KALISPELL-----in Room 35, Montana Hall, Flathead Valley Community College, 15 First St. E.

MILES CITY-----in Room 107, Miles Community College, 2715 Dickinson

MISSOULA-----in Room 102, Liberal Arts Building, University of Montana

By March 4, as required by ARM 16.18.204, everyone taking examinations must have:

- completed an application for certification as a water/wastewater operator.
- paid appropriate application (or renewal) fees for fiscal year 85 which ends 6/30/85.
- submitted examination registration slips and fees of \$5 per examination.

APPLICATION FEES ARE: Class 1-\$27; Class 2-\$22; Class 3-\$17; Class 4-\$12; Class 5-\$10
To request application materials, order study materials, or ask for additional information, call the certification office at 444-2691 or write: DHES - WATER QUALITY BUREAU; Water and Wastewater Operator Certification; Room A206, Cogswell Building, Helena, MT. 59620

PLEASE RETAIN THE UPPER PORTION OF THIS NOTICE. NO ADDITIONAL NOTICE WILL BE SENT TO YOU.

EXAMINATION REGISTRATION SLIP

(Detach and return with \$5 per examination by March 4, 1985)

I will take the examination(s) I have checked below at: ☐ Billings ☐ Butte
☐ Great Falls ☐ Havre ☐ Helena ☐ Kalispell ☐ Miles City ☐ Missoula

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
A--Water Distribution	<input type="checkbox"/>	<input type="checkbox"/>	* <input type="checkbox"/>	* <input type="checkbox"/>	<input type="checkbox"/>
B--Water Treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	* <input type="checkbox"/>	5AB <input type="checkbox"/>
C--Wastewater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Combination examinations are offered for 3A4B, 4A4B, and 5AB and require \$5 remittance only.

NAME _____ ADDRESS _____ SYSTEM _____

Aesthetic Water Problems

BY: Jim Melstad
Water Quality Bureau

Montana has a very wide variety of drinking water sources, ranging from mountain streams to deep groundwater wells. As you would expect, the water quality from these sources also varies widely. Mountain waters can be so soft that they actually cause corrosion in metal pipes. Groundwater in some parts of the state is so heavily mineralized that it is unsuitable for human and livestock consumption or for irrigation. Most of us are fortunate enough to have water that is somewhere in between the extremes, but we still often run into water quality problems. Water quality problems that aren't thought of as health related are usually referred to as aesthetic problems. Some of the more common aesthetic problems are discussed below. Also mentioned are tests (and associated costs) that can be run to check for the particular problem. Treatment is also briefly discussed.

Hardness

Hardness is caused by minerals in the water that react with soap to form insoluble curds. Calcium and magnesium are the principal sources of hardness. Iron, manganese and other metals can cause hardness, but usually only in very small amounts. Calcium, magnesium and the metal ions are positively charged ions (cations). For these ions to be dissolved in water, there must also be corresponding negatively charged ions (anions) dissolved in the water. However, the positively charged ions are the ones responsible for hardness. Excessive hardness can cause unreasonable soap consumption. The Water Quality Bureau (WQB) provides the following general rating of waters for hardness.

<u>Hardness (as Calcium Carbonate)</u>	<u>Rating</u>
0-85 mg/l (0-5 grains)	relatively soft
85-205 mg/l (5-12 grains)	moderately hard
205-427 mg/l (12-25 grains)	hard
427-684 mg/l (25-40 grains)	very hard
Over 684 mg/l (over 40 grains)	excessively hard

There has been some apparently unjustified concern that hard water can cause heart and other cardiovascular problems. Studies done in this country, Canada and the United Kingdom suggest that hard water is actually beneficial and soft water may cause cardiovascular problems.

When hard water is heated or when it evaporates, it typically leaves scale behind. Depending on the type of hardness, the scale may be "permanent" or "temporary". Permanent scale is left when the water has a

high percentage of sulfate and chloride anions compared to the percent of carbonate and bicarbonate anions. (The carbonate and bicarbonate content is usually referred to as alkalinity.) Temporary scale is left when the percent of alkalinity is high compared to the percent of sulfate and chloride. Temporary scale is termed temporary because it can be removed with acid treatments. Permanent scales are not easily removed and can be very troublesome.

Hardness removal is usually accomplished at home with an ion exchange softener that exchanges sodium cations for the magnesium and calcium cations. A resin material accomplishes the exchange, but must be periodically regenerated with salt. When hardness is removed at a municipal water treatment plant, lime-soda ash treatment is typically used. Hardness can be tested for at most private laboratories as well as at the DHES Chemistry Lab. The test is done by simply testing for calcium and magnesium and then combining the results. The cost is low, typically \$8.00-\$10.00.

Iron

High iron levels in groundwater are common in Montana. A level of 0.3 mg/l is usually the recommended limit. Levels above 0.3 mg/l can cause fixture and laundry staining and rust deposits in watermains and reservoirs. Iron is usually dissolved in groundwater and in a reduced (ferrous) state. When it comes into contact with oxygen in the air and/or chlorine, it is oxidized to the ferric state and precipitates as ferric hydroxide (rust). Iron is not considered harmful and is actually an essential nutrient, but will cause unpleasant tastes if present in high amounts.

Iron testing is available for \$5.00-\$10.00 from private labs and the DHES Chemistry Lab. Iron can be removed by several methods as follows:

1. Precipitation after oxidation followed by filtration. This method is used quite commonly in municipal water treatment plants. Aeration and chlorination are used to oxidize the iron. (Lime is added also if the natural pH is too low to permit rapid oxidation). After sedimentation, the water is filtered through rapid sand or rapid sand/anthracite filters. Variations of this general scheme are used to suit specific situations.
2. Ion exchange. (Typically "greensand" filtration.) Iron removal for private homes is typically accomplished with small ion exchange units. Some small community supplies also utilize ion exchange removal. This process is typically called "greensand" filtration. Potassium permanganate is fed to the raw water and oxidizes the iron. The exchange medium is coated with the oxides and eventually has to be regenerated with the potassium permanganate.
3. Stabilization (or dispersion) with polyphosphates. Iron and manganese concentrations up to one milligram per liter can often be prevented from oxidizing by this method. The polyphosphates must be added prior to chlorination. Excessive polyphosphate addition can cause bacterial growths in distribution systems.

Manganese

Manganese is also commonly found in Montana groundwater. It produces problems very similar to those described for iron. Manganese stains, however, are usually darker and can be described as dark brown or black. The recommended limit for manganese is only 0.05 mg/l. Manganese is removed by the same methods as those for iron removal, but manganese is usually more difficult to oxidize. Manganese testing runs \$5.00-\$10.00.

Sulfate

Sulfate is almost always found in Montana groundwater. Levels up to 250 mg/l are usually regarded as acceptable, but levels higher than 250 mg/l are commonly used. Levels above 250 mg/l can cause laxative effects in people not used to the water. Residents using the water regularly become used to the water unless the level is excessive. Excessive levels (say, above 1000 mg/l) can make water practically unusable because of tastes and unsuitability for irrigation.

Removal is difficult, especially for large water supplies. Some individual home units can be effective. Testing is available for about \$10.00.

Total Dissolved Solids (TDS)

The total dissolved solids are the combined level of dissolved substances in the water. The solids are mainly carbonates, bicarbonates, sulfates, chlorides, phosphates and some nitrates. TDS is often estimated by making a conductivity measurement. TDS is a very good general indicator of overall water quality. TDS levels below 500 mg/l generally indicate an acceptable water. Much higher levels are found and used commonly in Montana groundwater. Generally, levels above 2000 mg/l begin to cause unpleasant tastes. Levels above 4000 mg/l usually render the water unusable for anything without demineralization.

Distillation or reverse osmosis treatment will correct TDS problems, but are impractical for most public water supplies. Testing by using a conductivity measurement is cheap, usually \$2.00-\$5.00.

Hydrogen Sulfide

Hydrogen sulfide (not sulfate) is usually the culprit responsible for "rotten egg" odor. Hydrogen sulfide is produced by anaerobic decomposition of organic matter and can be found naturally in groundwater wells. Its presence, although unpleasant, does not typically indicate any contamination and is not harmful at the levels normally found in groundwater. (Hydrogen sulfide found in higher levels in sewage pumping stations, sewers, treatment plants etc. can be very harmful, however, and is even flammable).

Oxidation by aeration or chlorination is usually effective in removal of this nuisance odor. Your nose is usually the best test for hydrogen sulfide rather than an expensive lab test.

Iron Bacteria

Iron bacteria are a nuisance present in many private and public water supplies, often without the owner's knowledge. Iron bacteria will oxidize ferrous iron to ferric iron and leave behind a precipitate of ferric hydrate. Iron levels in the water do not have to be excessive for the bacteria to exist and grow. The bacteria are not harmful themselves but their presence can create undesirable and eventually unsanitary conditions if they are allowed to persist. They typically grow in conjunction with other bacteria, a group commonly referred to as sulfur bacteria. Sulfur bacteria can also produce undesirable conditions, including the production of hydrogen sulfide gas.

Together the problems produced can range from red color or turbidity in the water to bad odors and clumps of unsightly "slime" growths. Corrosion of pipes and well casings has even been associated with these growths. The slime or mat that these growths produce make it very difficult to correct the problem. Heavy repeated chlorination doses may be necessary to correct the problem. Sometimes the problem is so persistent that a well may have to be abandoned unless very expensive corrective methods are used.

One way to check for a suspected problem is to look inside of a toilet tank. Often, the growths will exist there if the problem is extensive throughout the system. The growth can occur throughout the distribution system, depending on pipe materials, and can occur in wells. If a sample of slime or mat suspected of being iron bacteria can be collected, the WQB can do a microscopic examination which can help determine what the growth is. There is presently no charge for this service.

If you have a question or comment, or need information on testing, call the Water Quality Bureau at 444-2406.

Quick Thinking, Rapid Response Save Clemetson

Quick thinking by a maintenance worker and rapid response by a paramedic saved the life of Stanley Clemetson of Plentywood when he accidentally fell through a manhole at the city sewage lagoon last month.

Clemetson and his assistant, David Getty, were working between two lagoons to remove a weir plank. Clemetson went down a flow control manhole and found he couldn't remove the plank. He climbed back up and asked Getty to hand him a pick-ax. As Getty turned to get the tool, Clemetson gasped for air and fell back into the manhole.

Fearing it might be methane gas, Getty immediately telephoned

for help which was the correct action to take since if he had descended into the manhole to help Clemetson, he might have also been overcome by the gas and both men could have died.

A paramedic, wearing a self-contained breathing apparatus, entered the manhole. After tying a rope around Clemetson, the paramedic pulled him to the surface. He was not breathing when he reached the top of the manhole, but was revived at the scene and rushed to the Sheridan Memorial Hospital in Plentywood.

Clemetson was released after nine days in the hospital.

Operators Certification Corner

1. The principal purpose of a primary clarifier is to:
 - a. remove grit and scum
 - b. reduce 5-day BOD
 - c. remove settleable solids
 - d. reduce chlorine demand
 - e. equalize flow
2. If outlet weirs in clarifiers are not kept level, which conditions are likely to occur?
 - a. solids removal will decrease and uneven flow distribution will occur.
 - b. solids removal will decrease and floating solids will be intercepted.
 - c. settled solids will become septic and uneven flow distribution will occur.
 - d. settled solids will become septic and floating solids will be intercepted.
3. Phosphates in a wastewater treatment plant effluent are undesirable because:
 - a. they inhibit aquatic life
 - b. they inhibit algal growths
 - c. they cause high BOD
 - d. they promote algal growths
 - e. they cause low BOD
4. Dissolved iron and manganese in water are undesirable primarily because they:
 - a. cause taste and odor
 - b. cause corrosion
 - c. cause staining
 - d. cause hardness
 - e. increase chlorides
5. The usual purpose of an altitude valve is to control:
 - a. water level in clear well
 - b. water level in raw water well
 - c. low water level in elevated tank
 - d. high water level in elevated tank
 - e. air pressure in distribution system
6. The excavated soil from a trench should be placed some distance from the top edge of the trench. The required minimum distance according to OSHA and State Workers' Compensation is:
 - a. 1.0 feet
 - b. 1.5 feet
 - c. 2.0 feet
 - d. 3.0 feet
 - e. 5.0 feet

7. Carbon dioxide in well water, if not removed, can cause a problem in the distribution system. Choose the principal problem that might occur.
- a. excessive incrustation
 - b. high chlorine demand
 - c. tastes and odors
 - c. bubbles in water
 - e. algal bloom
 - f. corrosion
8. Which of the following dissolved gases is likely to decrease during aeration?
- a. methane and oxygen
 - b. ammonia and oxygen
 - c. carbon dioxide and hydrogen sulfide
 - d. oxygen and hydrogen sulfide
 - e. oxygen and carbon dioxide
9. If a paddle wheel flocculator is operated at a speed faster than design:
- a. solids will settle out in clear well
 - b. there will be increased chlorine demand
 - c. floc will settle out
 - d. settling efficiency will be increased
 - e. there will be an adverse effect on floc formation
10. Which of the following materials kills bacteria most rapidly?
- a. free available chlorine
 - b. chloramine
 - c. combined available chlorine
 - d. polyphosphate

Operators Club

The Quarter Century Operators' Club is an informal group of active or corporate members of any Member Association of the Water Pollution Control Federation. The Montana Water Pollution Control Association does not currently have such a club.

To qualify for membership one must have been engaged in wastewater treatment plant operation on a full-time resident

basis for 25 years before the date of admission to the club. One does not, however, have to be actively participating in the operation of a wastewater treatment plant at the time of induction.

If you or anyone you know meets the qualifications for membership, please contact Jan Cranor at the Water Quality Bureau.

Missoula Hosts Conference

The 1985 Joint Conference of the MSAWWA and MWPCA will be held this year in Missoula, Montana on March 27, 28 and 29, 1985. The conference will be held in the newly remodeled Village Red Lion Motor Inn.

The Missoula Host Committee would like to express a warm invitation to this year's conference which promises to be both fun and informative.

The general registration fees include the cost of 2 luncheons, the get acquainted dinner party, awards dinner, dance and tours. Bring your husband or wife, they will enjoy the informative and entertaining program planned during the convention. Their fee also includes the above meals plus two continental breakfasts and tours.

Please send in the attached pre-registration form by March 1, 1985.

1985 JOINT CONFERENCE OF THE
MSAWWA and MWPCA
March 27, 28 and 29, 1985
Missoula, Montana

WEDNESDAY

12:00 Registration
Village Red Lion Motor Inn
1:00 Exhibit Areas Open
2:00 Champion International Corporation Paper Mill Tour

THURSDAY (Joint Session)

10:00 Communications/Effective Public Relations
U of M Communications Department will speak.
11:00 Flathead Lake Water Quality Changes
Dr. Jack Stanford, U of M, will speak on Flathead Lake Water quality.
1:30 Computer User's Group
Discussion of various hardware and software packages available for utilities.
2:15 Operator Training Seminar
Fred Delvecchio will speak on operator training.
3:00 Master Flow Metering
Selection and application of flow meters.
7:30 Buffet

FRIDAY (Split Sessions)

Water

8:00 Automation
Small plant automation will be discussed.
8:45 Plant Operation for Giardia Removal
Brown and Caldwell will discuss this topic.
9:30 Steps for Developing Municipal Groundwater Sources
Max Botz, Hydrometrics
10:30 Water Loss Reduction
David Welch, Community Consultant, Inc., will discuss reduction of water losses in distribution systems.

Wastewater

- 8:00 Planned Maintenance Procedures
A panel discussion.
- 8:45 Wastewater Rates/Connection Fees
Brown and Caldwell will discuss current trends.
- 9:30 Anaerobic Digestors
Mark Weston will discuss the merits of digestors and their operation.
- 10:30 Improved Plant Performance through the CPE-CCP Approach
Process Applications, Inc. will discuss performance improvement in Montana.

FRIDAY (Joint Session)

- 1:30 Pipeline Rehabilitation
Rehabilitation - methods and merits.
- 2:15 Personal Liabilities of Public Officials
Jim Tillotson, City Attorney, Billings, MT, will discuss the legalities of public facilities operation.
- 7:30 Awards Banquet

SPOUSES PROGRAM

WEDNESDAY

- 12:00 Registration
Village Red Lion Motor Inn
- 2:00 Champion International Corporation Paper Mill tour

THURSDAY

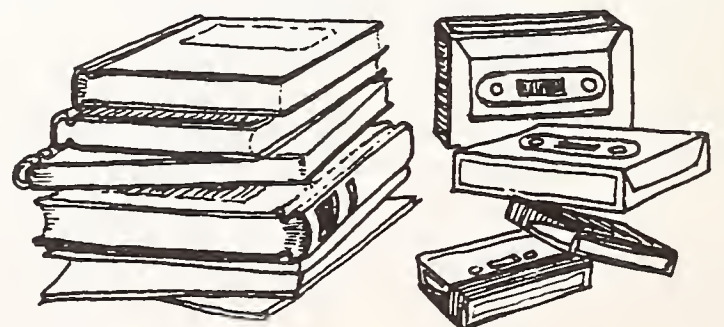
- 9:00 Continental Breakfast
- 10:30 Candy Making Demonstration
- 12:00 Luncheon and Style Show
- 2:30 Home Show
- 7:30 Buffet

FRIDAY

- 9:00 Continental Breakfast
- 10:30 Money Management Seminar with DAD
- 12:00 Luncheon with Conference Delegates
- 1:30 Shopping - Southgate Mall or Antique Store Tour
- 7:30 Awards Banquet

Answers:

a	• 01	p	• 5
e	• 6	c	• 4
c	• 8	p	• 3
f	• 7	a	• 2
c	• 6	c	• 1



ADVANCE REGISTRATION APPLICATION
ANNUAL CONFERENCE OF MSAWWA AND MWPCA
March 27, 28, and 29, 1985

CONVENTION HEADQUARTERS:

VILLAGE RED LION MOTOR INN
100 Madison Street
Missoula, Montana 59802
(406) 728-3100

SEND TO: Missoula Host Committee, P.O. Box 5709, Missoula, Montana 59806

\$65.00 _____ Member Registration \$30.00 _____ Ladies Registration
\$75.00 _____ Nonmember Registration \$40.00 _____ One-Day Registration*

Enclosed please find a check, purchase order, or warrant payable to Missoula Host Committee AWWA/WPCF in the amount of \$ _____. Pre-registration must be received by March 1, 1985.

NAME _____ TITLE _____

UTILITY, CITY, CO., _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

IF ATTENDING: WIFE'S NAME _____

MEMBER AWWA _____ MEMBER WPCF _____ NONMEMBER _____

STUDENT _____ LIFE MEMBER _____

*This rate also applies to students and life members.

Missoula Host Committee

Water Quality Bureau
Department of Health
& Environmental Sciences
Room A206, Cogswell Bldg.
Helena, MT 59620

TO:

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